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(54) Title of the Invention: IMAGE DISPLAY DEVICE

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## SPECIFICATION

### 1. Title of the Invention

#### IMAGE DISPLAY DEVICE

### 2. Claims

(1) An image display device [i] which has at least an image display panel, driving hybrid ICs and a metal case, [ii] in which the above-mentioned image display panel and the above-mentioned hybrid ICs are electrically connected, and [iii] in which the above-mentioned image display panel and metal case are fastened together by means of a two-sided adhesive tape, this image display device being characterized by the fact that the above-mentioned metal case is constructed from a plurality of metal plates forming a set that can be disassembled, the metal plates that form the above-mentioned set are assembled into a frame having the shape of a well crib, and these metal plates are each individually attached to the above-mentioned image display panel by means of a single two-sided adhesive tape.

### 3. Detailed Description of the Invention

#### (Field of Industrial Utilization)

The present invention relates to an image display device, and more particularly relates to the fastening structure of an image display panel that is constructed from planer glass [plates] such as a liquid crystal display panel or plasma display panel.

#### (Prior Art)

Figure 3 (a) is a structural diagram which shows a conventional image display device, and Figure 3 (b) is a sectional view along line C-C' in Figure 3 (a). In Figures 3 (a) and 3 (b), the image display panel 1 is fastened to a metal case 9 by means of two-sided adhesive tapes 5 through 8 after hybrid ICs 2 through 4 used for driving are connected to a plurality of terminals disposed on the peripheral parts [of the image display panel 1]. Next, [this assembly is] covered by a metal cover (not shown Figures 3 (a) and 3 (b)), so that the image display panel 1 and driving hybrid ICs 2 through 4 (which have a weak mechanical strength) are protected by this metal cover.

**(Problem that the Invention is to Solve)**

The above-mentioned conventional image display device suffers from the following drawback: namely, since the image display panel 1 to which the driving hybrid ICs 2 through 4 are connected is fastened to a single metal case 9 by means of a plurality of two-sided adhesive tapes, repair is impossible in cases where a fault occurs in the connections between the image display panel 1 and the driving hybrid ICs 2 through 4.

Since the image display panel 1 uses expensive devices and requires considerable time for manufacture, this image display panel 1 is expensive. Accordingly, in cases where a fault occurs in the connections of the driving hybrid ICs 2 through 4, it is advantageous from an industrial standpoint to disassemble [the image display panel 1] and reconnect [the driving hybrid ICs 2 through 4]. However, as is shown in Figures 3 (a) and 3 (b), such reconnection cannot be performed in a state in which the image display panel 1 is fastened to the metal case 9; accordingly, it is necessary to separate the image display panel 1 and metal case 9. However, since the two-sided adhesive tapes 5 through 8 used for fastening have a strong adhesive strength, and since the image display panel 1 is fastened to a single metal case 9 by a plurality of two-sided adhesive tapes 5 through 8, it is impossible to disassemble [this assembly] without damaging the image display panel 1.

The object of the present invention is to provide an image display device that solves the above-mentioned problem.

**(Difference Between the Invention and the Prior Art)**

In contrast to the above-mentioned conventional image display device, the present invention is devised so that the metal case can be disassembled into a plurality of metal plates, and so that each of these metal plates is fastened to the image display panel by a single two-sided adhesive tape. Accordingly, the present invention differs [from the conventional image display device] in that the device can be disassembled without damaging the image display panel.

**(Means for Solving the Problem)**

In the image display device of the present invention, in order to achieve the above-mentioned object, the device is an image display device [i] which has at least an image display panel, driving hybrid ICs and a metal case, [ii] in which the above-mentioned image display panel and the above-mentioned hybrid ICs are electrically connected, and [iii] in which the above-mentioned image display panel and metal case are fastened together by means of a two-sided adhesive tape, wherein the above-mentioned metal case is constructed from a plurality of metal

plates forming a set that can be disassembled, the metal plates that form the above-mentioned set are assembled into a frame having the shape of a well crib, and these metal plates are each individually attached to the above-mentioned image display panel by means of a single two-sided adhesive tape.

(Embodiments)

Embodiments of the present invention will be described below.

(Embodiment 1)

Figure 1 (a) is a plan view showing Embodiment 1 of the present invention. Figure 1 (b) is a sectional view along line A-A' in Figure 1 (a).

In the figures, 1 indicates an image display panel 1 [sic]; driving hybrid ICs 2 through 4 are attached to the periphery of this image display panel 1.

In the present invention, a metal case 9 that is mounted on the image display panel 1 is constructed from four metal plates 10 through 13 which form a set that can be disassembled. The metal plates 10 through 13 that form this set of four are assembled into a frame that has the shape of a well crib, and each of the metal plates 10 through 13 is individually attached to the image display panel 1 using a single two-sided adhesive tape (5 ~ 8). The connecting parts of the four metal plates 10 through 13 are detachably connected by means of screws 18 through 25.

After the driving hybrid ICs 2 through 4 are connected to a plurality of terminals disposed on the peripheral parts of the image display panel 1, the respective metal plates 10 through 13 that have been assembled into a metal case by means of the screws 18 through 25 are fastened by means of the two-sided adhesive tapes 5 through 8. In cases where the image display panel 1 and the metal case assembled by means of the metal plates 10 through 13 are to be disassembled, after releasing the connection of the respective metal plates 10 through 13 from which the screws 18 through 25 have been unscrewed, the metal plates 10 through 13 are pulled off of the image display panel 1.

In the present invention, when the image display panel 1 is to be removed from the metal case, the metal case is disassembled into individual metal plates. Furthermore, since each metal plate is attached to the image display panel by a single two-sided adhesive tape, the metal plates are pulled off of the image display panel one at a time. This allows the image display panel to be easily stripped compared to a case in which a metal case and image display panel connected by a plurality of two-sided adhesive tapes are pulled apart as in a conventional [system], so that there is no damage to the imaged display panel.

**(Embodiment 2)**

Figure 2 (a) is a plan view showing Embodiment 2 of the present invention, and Figure 2 (b) is a sectional view along line B-B' in Figure 2 (a).

In the embodiment described above, the metal plates 10 through 13 were connected by the screws 18 through 25 with the end parts of the metal plates 10 through 13 overlapped above and below. In the present embodiment, on the other hand, rising parts 14a through 17a are formed on metal plates 14 through 17 that are assembled in the form of a frame, and these rising parts 14a through 17a are caused to abut against each other in the horizontal direction, and are connected by means of screws 26 through 33.

**(Effect of the Invention)**

In the present invention, as was described above, the metal case can be disassembled into a plurality of metal plates, and each of the metal plates is fastened to the image display panel by a single two-sided adhesive tape. Consequently, [the metal case] can be disassembled without damaging the image display panel. Accordingly, in cases where faults occur in the connections between the image display panel and driving hybrid ICs, [the present invention] has the effect of allowing disassembly and reconnection.

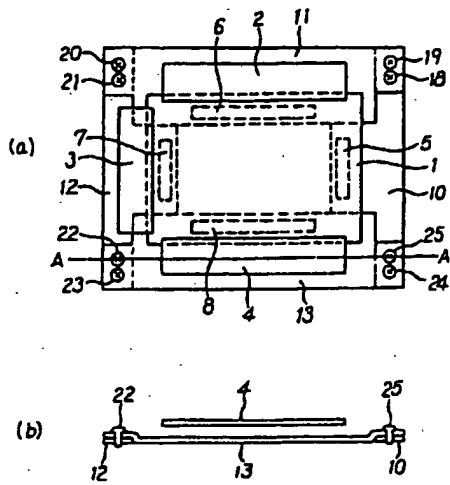
**4. Brief Description of the Drawings**

Figure 1 (a) is a plan view which shows Embodiment 1 of the present invention. Figure 1 (b) is a sectional view along line A-A' in Figure 1 (a). Figure 2 (a) is a plan view which shows Embodiment 2 of the present invention. Figure 2 (b) is a sectional view along line B-B' in Figure 2 (a). Figure 3 (a) is a plan view which shows a conventional example. Figure 3 (b) is a sectional view along line C-C' in Figure 3 (a).

- 1... Image display panel
- 2 ~ 4... Driving hybrid ICs
- 5 ~ 8... Two-sided adhesive tapes
- 9... Metal case
- 10 ~ 17... Metal plates
- 18 ~ 33... Screws

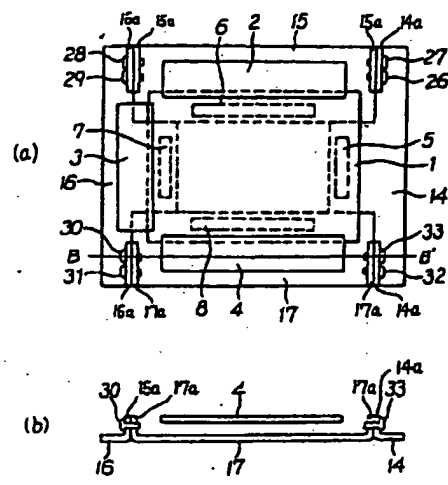
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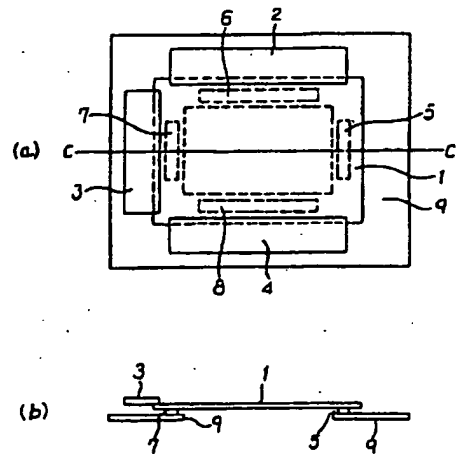
**Figure 1**

- 1: Image display panel
- 2 ~ 4: Driving hybrid ICs
- 5 ~ 8: Two-sided adhesive tapes
- 10 ~ 13: Metal plates
- 18 ~ 25: Screws



**Figure 2**

- 1: Image display panel
- 2 ~ 4: Driving hybrid ICs
- 5 ~ 8: Two-sided adhesive tapes
- 14 ~ 17: Metal plates
- 26 ~ 33: Screws



**Figure 3**